



TETRA TECH

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Addendum 1

Brandywine School District
Wilmington, DE

Bid No.: BSD 18005-GCSERVICES-CARRCROFT

Brandywine School District – Carrcroft Elementary School Addition and Renovation

Tt Project No. 200-15704-17001

Addendum No. 1
to
Drawings and Project Manual

December 22, 2017

NOTE: Bid Due date is extended to Thursday, February 1, 2018 – 2:00 pm. Bids are to be delivered to Carrcroft Elementary School’s Cafeteria.

To: ALL BIDDERS

This ADDENDUM forms a part of the BIDDING AND CONTRACT DOCUMENTS and modifies the following documents:

Original DRAWINGS dated December 12, 2017

PROJECT MANUAL dated December 12, 2017.

Acknowledge receipt of the ADDENDUM in the space provided on the FORM OF PROPOSAL

This ADDENDUM consists of three (3) pages not including the attachments:

1.0 PROJECT MANUAL – MODIFICATIONS

- 1.1 Spec Section 000115 LIST OF DRAWINGS – see attached.
- 1.2 Replaced Section 081416 FLUSH WOOD DOORS – see attached.
- 1.3 Added Section 042000 UNIT MASONRY – see attached.

2.0 DRAWINGS – MODIFICATIONS

- 2.1 Replaced Cover Sheet – see attached.
- 2.2 Replaced S-101 Structural Foundation & Framing Plans - see attached.

- 2.3 Replaced S-301 Structural Foundation Sections & Details - see attached.
- 2.4 Replaced S-302 Structural Framing Sections & Details - see attached.
- 2.5 Replaced S-304 Structural Framing Sections & Details - see attached.
- 2.6 Replaced S-502 Structural Framing Elevations and Details - see attached.
- 2.7 Replaced A-101 First Floor New Construction Plan – see attached.
- 2.8 Replaced A-102 Lower Demolition & New Construction Plan – see attached.
- 2.9 Replaced A-201 Exterior Elevations & Building Sections – see attached.
- 2.10 Replaced A-201A Alternate Exterior Elevations - see attached.
- 2.11 Replaced A-601 Door Schedule, Window & Door Details - see attached.

3.0 PRE-BID MEETING NOTES:

- 3.1 Tim Skibicki (TS) read the project name, number and stated this was a mandatory Pre-Bid Meeting.
- 3.2 The bid due date and location was reviewed. John Read (JR) stated the bid due date may be extended to provide adequate bidding time. JR requested bidders let him know if their having problems with participation from subcontractors due to an inadequate amount bidding time. **POST MEETING NOTE: Bid Due date is extended to Thursday, February 1, 2018 – 2:00 pm. Bids are to be delivered to Carrcroft Elementary School’s Cafeteria.**
- 3.3 TS gave a general overview of the Project Scope.
- 3.4 JR distributed and discussed the Project Schedule. The schedule is included in the Project Manual and attached to this addendum.
- 3.5 Alternates were reviewed:
 - 3.5.1 Alternate #1: Emergency Generator
 - 3.5.2 Alternate #2: Corridor & Gymnasium Lighting
 - 3.5.3 Alternate #3: Fiber Cement Siding in Lieu of Brick Veneer
- 3.6 Unit Prices were reviewed:
 - 3.6.1 Unit Price #1: Removal of unsatisfactory soil.
 - 3.6.2 Unit Price #2: Rock excavation and replacement with satisfactory soil material.
- 3.7 Other Work performed by or contracted directly with the Owner was reviewed and is listed below:
 - 3.7.1 Automatic Temperature Control
 - 3.7.2 Construction Inspection and Testing
 - 3.7.3 Data Wiring (raceways, boxes and conduit is included in the General Contractor’s Scope of Work).
 - 3.7.4 Abandoned Tank Removal
- 3.8 TS noted the Geotechnical Report was included in the Project Manual. The Earthmoving Specification Section 31 20 00 was coordinated with the Geotechnical Report. The Report found that shallow soils are high moisture clays which will not likely be suitable for reuse during structural foundation backfilling. It was pointed out that the Earthmoving specification requires that the contractor will be responsible to provide suitable soils, meeting the specification, in the event onsite soils are not suitable for structural backfilling purposes.

3.9 JR requested bidders contact him regarding gaining access to the building and provided his cell phone number.

ATTACHMENT LIST

1. Project Construction Schedule from Brandywine S.D.
2. Pre-bid Meeting Sign-In Sheet
3. Register of Bid Documents
4. List of Drawings
5. Specification 042000 UNIT MASONRY
6. Specification 081416 FLUSH WOOD DOORS
7. G-000 COVER SHEET
8. S-101 - STRUCTURAL FOUNDATION & FRAMING PLANS
9. S-301 - STRUCTURAL FOUNDATION SECTIONS & DETAILS
10. S-302 - STRUCTURAL FRAMING SECTIONS & DETAILS
11. S-304 - STRUCTURAL FRAMING SECTIONS & DETAILS
12. S-502 - STRUCTURAL FRAMING ELEVATIONS AND DETAILS
13. A-101 - FIRST FLOOR NEW CONSTRUCTION PLAN
14. A-102 - LOWER LEVEL DEMOLITION & NEW CONSTRUCTION PLAN
15. A-201 - EXTERIOR ELEVATIONS & BUILDING SECTIONS
16. A-201A- ALTERNATE EXTERIOR ELEVATIONS
17. A-601 - DOOR SCHEDULE, WINDOW & DOOR DETAILS

END OF ADDENDUM No. 1



TETRA TECH

240 Continental Drive, Suite 200, Newark, Delaware 19713

PREBID MEETING SIGN-IN SHEET

BRANDYWINE SCHOOL DISTRICT
CARRCROFT ELEM. SCHOOL - ADDITION AND RENOVATION

TT PROJECT NO.: 200-15704-17001
DATE: 12/12/17

	Name	Company	Physical Address	Telephone	Fax	e-mail
1	Tim Skibivka	Tetra Tech				
2	Bill Michelinic	BCI	34 Industrial Blvd. New Castle, DE	325-2700	325-2733	bmichelinic@bcionline.com
3	Ryan Anderson	BSS	281 E Evergreen St. suite 3 West Grove PA 19380	(484) 256 4994		bsmith@bsscontractors.com
4	Ken Adams	Pace Elect.	3603 Old Cap Trail Wilm 19808	302 321-2650		KADAMS@PACEDE.CO
5	Dave McCarthy	Commonwealth Const. Co.	2317 Pennsylvania Av Wilm DE 19806	302-654-6611		DMCCARTHY@COMMONWEALTH.CO
6	Kyle Contino	GEM Mechanical	5161 Birney Highway Aston, PA 19074	610-381-9667		Kyle@GEMM5I.CO
7	PO Anderson	EDIS	110 S. Pooler St. Wilm, DE 19801	(302) 421-2961		pjanderson@ediscompany.co
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	Name	Company	Physical Address	Telephone	Fax	e-mail
15						
16	Tony Ventresca	Ventresca Bros., Inc.	2300 N. Dupont Hwy. New Castle, DE 19720	302-658-6436	302-658-2360	Tony@VentrescaBros.com
17	Stacy Bush	Amaker, Inc	72 Clinton St 19706	302 884 8664	-8681	Amaker@aol.com
18	Kerry Racca	DANCRIFT	1300 N. GUNN AVENUE WILMINGTON, DE 19803	302 254 4967		KRACCA@ DANCRIFTUSA.COM
19	Kenny Fetchko	Whitby-Turner	131 Conhenty / One Newark DE	302-292-0676		Kenny.Fetchko@whitby-turner.com
20	Scott Comberbach	EDIS	Kort PEDIS Company, CORP			
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Bids Due: **2:00 p.m., January 18, 2018**
Carrcroft Elementary School
School Cafeteria
503 Crest Road
Wilmington, DE 19803

REGISTER OF BID DOCUMENTS
PLEASE PRINT CLEARLY

\$ 50.00 per set

<p>#01</p>	<p>Name of Company: <u>Commonwealth Construction Co.</u></p> <p>Physical Address: <u>2317 Pennsylvania Ave.</u> City, State: <u>Wilmington, DE 19806</u></p> <p>Contact: <u>Bill Booth</u> GC: YES <input checked="" type="checkbox"/> NO <input type="checkbox"/></p> <p>Phone: <u>302-654-6611</u></p> <p>Fax: _____ Date: <u>12/12/2017</u></p> <p>E-Mail: bbooth@itscommonwealth.com</p>
<p>#02</p>	<p>Name of Company: <u>BCI</u></p> <p>Physical Address: <u>34 Industrial Blvd.</u> City, State: <u>New Castle, DE 19720</u></p> <p>Contact: <u>Bill Michelinie</u> GC: YES <input checked="" type="checkbox"/> NO <input type="checkbox"/></p> <p>Phone: <u>302-325-2700</u></p> <p>Fax: _____ Date: <u>12/12/2017</u></p> <p>E-Mail: bmichelinie@bci-online.com</p>
<p>#03</p>	<p>Name of Company: <u>McCarthy Construction, Inc.</u></p> <p>Physical Address: <u>601 W. Ashland Ave</u> City, State: <u>Glenodlen, PA 19036</u></p> <p>Contact: <u>Pat McCarthy</u> GC: YES <input checked="" type="checkbox"/> NO <input type="checkbox"/></p> <p>Phone: <u>610-6522-1553</u></p> <p>Fax: _____ Date: <u>12/12/2017</u></p> <p>E-Mail: pat@mccarthyconstructioninc.com</p>

Carrcroft Elementary School - Addition and Renovations
Brandywine School District

200-15704-17001

Bids Due: **2:00 p.m., January 18, 2018**
Carrcroft Elementary School
School Cafeteria
503 Crest Road
Wilmington, DE 19803

REGISTER OF BID DOCUMENTS
PLEASE PRINT CLEARLY

\$ 50.00 per set

<p>#04</p>	<p>Name of Company: <u>The Whiting Turner Contracting Co.</u></p> <p>Physical Address: <u>131 Continental Drive</u> City, State: <u>Newark, De 19713</u></p> <p>Contact: <u>Kenny Felchko</u> GC: YES <input checked="" type="checkbox"/> NO <input type="checkbox"/></p> <p>Phone: <u>609-458-4590</u></p> <p>Fax: _____ Date: <u>12/12/2017</u></p> <p>E-Mail: kenny.fetchko@whiting-turner.com</p>
<p>#05</p>	<p>Name of Company: <u>Amakor, Inc.</u></p> <p>Physical Address: <u>92 Clinton Street</u> City, State: <u>Delaware City, De 19706</u></p> <p>Contact: <u>Steve Serbu</u> GC: YES <input checked="" type="checkbox"/> NO <input type="checkbox"/></p> <p>Phone: <u>302-834-8664</u></p> <p>Fax: _____ Date: <u>12/12/2017</u></p> <p>E-Mail: amakor@aol.com</p>
<p>#06</p>	<p>Name of Company: <u>Ventresca Bros., Inc.</u></p> <p>Physical Address: <u>2300 N. Dupont Hwy.</u> City, State: <u>New Castle, DE 19720</u></p> <p>Contact: <u>Tony Ventresca</u> GC: YES <input checked="" type="checkbox"/> NO <input type="checkbox"/></p> <p>Phone: <u>302-658-6436</u></p> <p>Fax: _____ Date: <u>12/18/2017</u></p> <p>E-Mail: tony@ventrescabros.com</p>

SECTION 00 01 15

LIST OF DRAWINGS

GENERAL

G-000 COVER SHEET
G-001 CODE ANALYSIS

CIVIL

C-01 CIVIL COVER SHEET
C-02 SITE DEMOLITION & PRE-CONSTRUCTION STORMWATER MANAGEMENT
PLAN
C-03 CONSTRUCTION SITE STORMWATER MANAGEMENT PLAN
C-04 CONSTRUCTION SITE NOTES & DETAILS
C-05 CONSTRUCTION SITE NOTES & DETAILS
C-06 GENERAL DEVELOPMENT LINES & GRADES PLAN
C-07 SITE CONSTRUCTION, LAYOUT & UTILITY PLAN
C-08 SITE CONSTRUCTION DETAILS
C-09 SITE CONSTRUCTION DETAILS

STRUCTURAL

S-001 STRUCTURAL GENERAL NOTES
S-101 STRUCTURAL FOUNDATION & FRAMING PLANS
S-301 STRUCTURAL FOUNDATION SECTIONS & DETAILS
S-302 STRUCTURAL FRAMING SECTIONS & DETAILS
S-501 STRUCTURAL FOUNDATION DETAILS
S-502 STRUCTURAL FRAMING ELEVATIONS & DETAILS

ARCHITECTURAL

A-001 ABBREVIATIONS, LEGENDS & GENERAL NOTES
AD-101 FIRST FLOOR DEMOLITION PLAN
A-100 OVERALL FIRST FLOOR NEW CONSTRUCTION PLAN
A-101 FIRST FLOOR NEW CONSTRUCTION PLAN
A-102 LOWER LEVEL DEMOLITION & NEW CONSTRUCTION PLAN
A-103 ROOF PLAN DEMOLITION & NEW WORK
A-104 FIRST FLOOR NEW REFLECTED CEILING PLAN
A-201 EXTERIOR ELEVATIONS & BUILDING SECTIONS
A-301 WALL SECTIONS
A-302 WALL SECTIONS
A-401 ENLARGED PLANS & ELEVATIONS
A-402 INTERIOR ELEVATIONS
A-403 ENLARGED STAIR PLANS & DETAILS
A-404 MILLWORK DETAILS
A-501 PARTITION TYPES & DETAILS

LIST OF DRAWINGS
00 01 15-1

Tetra Tech
200-15704-17001

- A-601 DOOR SCHEDULE, WINDOW & DOOR DETAILS
- A-810 FIRST FLOOR FINISH PLAN & SCHEDULE

MECHANICAL

- M-100 LEGEND, NOTES, & DETAILS - MECHANICAL
- MD-101 FIRST & SECOND FLOOR PLANS DEMOLITION– MECHANICAL
- M-101 BASEMENT DEMOLITION/NEW WORK – MECHANICAL
- M-102 FIRST FLOOR PLAN – MECHANICAL DUCTWORK
- M-103 FIRST FLOOR PLAN – MECHANICAL PIPING
- M-501 DETAILS – MECHANICAL
- M-502 DETAILS – MECHANICAL
- M-503 AIR FLOW DIAGRAMS & ATC SEQUENCE OF OPERATIONS - MECHANICAL
- M-601 SCHEDULES – MECHANICAL

FIRE PROTECTION

- FP-100 LEGEND, NOTES, & DETAILS – FIRE PROTECTION
- FP-101 FIRST FLOOR PLAN DEMOLITION – FIRE PROTECTION
- FP-102 FIRST FLOOR PLAN– FIRE PROTECTION

PLUMBING

- PD-101 FIRST FLOOR PLAN DEMOLITION - PLUMBING
- P-100 LEGEND, SCHEDULE, & DETAILS - PLUMBING
- P-101 BASEMENT DEMOLITION/NEW WORK – PLUMBING
- P-102 FIRST FLOOR PLAN – PLUMBING
- P-103 KITCHEN PLANS – PLUMBING

ELECTRICAL

- ED-101 LEGEND, NOTES, & BASEMENT DEMOLITION PLAN – ELECTRICAL
- ED-102 FIRST FLOOR PLAN DEMOLITION – ELECTRICAL
- ED-103 FIRST FLOOR PLANS DEMOLITION – ELECTRICAL
- ED-104 SECOND FLOOR PLAN DEMOLITION – ELECTRICAL
- E-101 LEGEND, SCHEDULE, & FIRST FLOOR PLAN – LIGHTING
- E-102 FIRST FLOOR PLAN – LIGHTING
- E-103 SECOND FLOOR PLAN – LIGHTING
- E-104 FIRST FLOOR PLAN – POWER
- E-105 FIRST FLOOR PLANS – POWER
- E-106 SCHEDULE, DETAIL, & SECOND FLOOR PLAN – POWER

FOOD SERVICE

- FS-1.0 FOOD SERVICE EQUIPMENT PLAN & SCHEDULE
- FS-1.1 FOOD SERVICE UTILITIES PLAN & SCHEDULES

END OF SECTION

SPEC SECTION 04 20 00

UNIT MASONRY

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:
 - 1. Concrete masonry units.
 - 2. Face brick.
 - 3. Mortar and grout.
 - 4. Steel reinforcing bars.
 - 5. Masonry joint reinforcement.
 - 6. Ties and anchors.
 - 7. Flashing.
 - 8. Miscellaneous masonry accessories.

1.3 DEFINITIONS

- A. CMU(s): Concrete masonry unit(s).
- B. Reinforced Masonry: Masonry containing reinforcing steel in grouted cells.

1.4 SUBMITTALS, GENERAL

- A. General: Submit all action submittals (except Shop Drawings and Samples for Verification) and informational submittals required by this Section concurrently.

1.5 ACTION SUBMITTALS

- A. Product Data: For each type of product indicated.
- B. Shop Drawings: For the following:

1. Reinforcing Steel: Detail bending and placement of unit masonry reinforcing bars. Comply with ACI 315, "Details and Detailing of Concrete Reinforcement." Show elevations of reinforced walls.
 2. Concrete Masonry Unit Control Joint Layout Plans: Plans, at minimum 1/8 inch = 1 foot scale, showing all concrete masonry unit control joint locations and types, in accordance with the typical masonry plan details shown on the Drawings, and as follows:
 - a. For each joint, indicate type of control joint; i.e., at columns indicate if joint is provided by the masonry grouted into the column web, or by joint stabilization anchors.
 3. Preformed and Fabricated Flashings:
 - a. Provide profiles for each flashing condition required.
 - b. Detail corner units, end dam units and other special applications.
- C. Samples for Initial Selection:
1. Face brick, in the form of portable display panels.
- D. Samples for Verification: For each type and color of the following:
1. Face brick, in the form of straps of five or more bricks.
 2. Weep holes and vents.
 3. Accessories embedded in masonry.

1.6 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For testing agency.
- B. Material Certificates: For each type and size of the following:
1. Masonry units.
 - a. Include material test reports substantiating compliance with requirements.
 - b. For brick, include size-variation data verifying that actual range of sizes falls within specified tolerances.
 - c. For exposed brick, include test report for efflorescence according to ASTM C 67.
 2. Cementitious materials. Include brand, type, and name of manufacturer.
 3. Preblended, dry mortar mixes. Include description of type and proportions of ingredients.
 4. Grout mixes. Include description of type and proportions of ingredients.
 5. Reinforcing bars.
 6. Joint reinforcement.
 7. Anchors, ties, and metal accessories.
- C. Mix Designs: For each type of mortar and grout. Include description of type and proportions of ingredients.
1. Include test reports for mortar mixes designed in accordance with property specification. Test according to ASTM C 109/C 109M for compressive strength, ASTM C 1506 for water retention, and ASTM C 91 for air content.
 2. Include test reports, according to ASTM C 1019, for grout mixes required to comply with compressive strength requirement.

- D. Cold-Weather and Hot-Weather Procedures: Detailed description of methods, materials, and equipment to be used to comply with requirements.

1.7 QUALITY ASSURANCE

- A. Testing Agency Qualifications: Qualified according to ASTM C 1093 for testing indicated.
- B. Source Limitations for Masonry Units: Obtain exposed masonry units of a uniform texture and color, or a uniform blend within the ranges accepted for these characteristics, from single source from single manufacturer for each product required.
- C. Source Limitations for Mortar Materials: Obtain mortar ingredients of a uniform quality, including color for exposed masonry, from single manufacturer for each cementitious component and from single source or producer for each aggregate.
- D. Masonry Standard: Comply with ACI 530.1/ASCE 6/TMS 602 unless modified by requirements in the Contract Documents.
- E. Mockups: Build mockups to verify selections made under sample submittals and to demonstrate aesthetic effects and set quality standards for materials and execution.
 - 1. Build mockups for each typical exterior wall type in sizes approximately 96 inches long by 72 inches high by full thickness, including face and backup wythes and accessories.
 - a. Include a 90-degree outside corner extending at least 24 inches from one end.
 - b. Include a window opening approximately 24 inches square showing return of veneer at jamb as well as lintel and sill construction.
 - c. Include metal studs, sheathing, bond beam, insulation, veneer anchors, flashing, cavity drainage material, and weep holes in exterior masonry-veneer wall mockups.
 - 1) Step back a portion of the mockup to reveal these materials and their installation.
 - d. For masonry wall construction at steel columns, include a typical steel column, showing the following:
 - 1) Connection/anchorage of CMU to column.
 - 2) Anchorage of veneer to column face.
 - 2. Clean one-half of exposed faces of mockups with masonry cleaner as indicated.
 - 3. Protect accepted mockups from the elements with weather-resistant membrane.
 - 4. Approval of mockups is for color, texture, and blending of masonry units; relationship of mortar and sealant colors to masonry unit colors; tooling of joints; and aesthetic qualities of workmanship.
 - a. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless such deviations are specifically approved by Architect in writing.

- F. Preinstallation Conference: Conduct conference at Project site.

1.8 DELIVERY, STORAGE, AND HANDLING

- A. Store masonry units on elevated platforms in a dry location. If units are not stored in an enclosed location, cover tops and sides of stacks with waterproof sheeting, securely tied. If units become wet, do not install until they are dry.
- B. Store cementitious materials on elevated platforms, under cover, and in a dry location. Do not use cementitious materials that have become damp.
- C. Store aggregates where grading and other required characteristics can be maintained and contamination avoided.
- D. Deliver preblended, dry mortar mix in moisture-resistant containers designed for use with dispensing silos. Store preblended, dry mortar mix in delivery containers on elevated platforms, under cover, and in a dry location or in covered weatherproof dispensing silos.
- E. Store masonry accessories, including metal items, to prevent corrosion and accumulation of dirt and oil.

1.9 PROJECT CONDITIONS

- A. Protection of Masonry: During construction, cover tops of walls, projections, and sills with waterproof sheeting at end of each day's work. Cover partially completed masonry when construction is not in progress.
 - 1. Extend cover a minimum of 24 inches down both sides of walls and hold cover securely in place.
- B. Do not apply uniform floor or roof loads for at least 12 hours and concentrated loads for at least three days after building masonry walls or columns.
- C. Stain Prevention: Prevent grout, mortar, and soil from staining the face of masonry to be left exposed or painted. Immediately remove grout, mortar, and soil that come in contact with such masonry.
 - 1. Protect base of walls from rain-splashed mud and from mortar splatter by spreading coverings on ground and over wall surface.
 - 2. Protect sills, ledges, and projections from mortar droppings.
 - 3. Protect surfaces of window and door frames, as well as similar products with painted and integral finishes, from mortar droppings.
 - 4. Turn scaffold boards near the wall on edge at the end of each day to prevent rain from splashing mortar and dirt onto completed masonry.
- D. Cold-Weather Requirements: Do not use frozen materials or materials mixed or coated with ice or frost. Do not build on frozen substrates. Remove and replace unit masonry damaged by frost or by freezing conditions. Comply with cold-weather construction requirements contained in ACI 530.1/ASCE 6/TMS 602.

1. Cold-Weather Cleaning: Use liquid cleaning methods only when air temperature is 40 deg F and higher and will remain so until masonry has dried, but not less than seven days after completing cleaning.
- E. Hot-Weather Requirements: Comply with hot-weather construction requirements contained in ACI 530.1/ASCE 6/TMS 602.

PART 2 - PRODUCTS

2.1 MASONRY UNITS, GENERAL

- A. Defective Units: Referenced masonry unit standards may allow a certain percentage of units to contain chips, cracks, or other defects exceeding limits stated in the standard. Do not use units where such defects will be exposed in the completed Work.
- B. Fire-Resistance Ratings: Where indicated, provide units that comply with requirements for fire-resistance ratings indicated as determined by testing according to ASTM E 119, by equivalent masonry thickness, or by other means, as acceptable to authorities having jurisdiction.

2.2 CONCRETE MASONRY UNITS

- A. Regional Materials: CMUs shall be manufactured within 500 miles of Project site from aggregates and cement that have been extracted, harvested, or recovered, as well as manufactured, within 500 miles of Project site.
- B. Shapes: Provide shapes indicated and as follows, with exposed surfaces matching exposed faces of adjacent units unless otherwise indicated.
 1. Provide special shapes for lintels, corners, jambs, sashes, movement joints, headers, bonding, and other special conditions.
 2. Provide bullnose units for outside corners unless otherwise indicated.
 3. Provide solid units where indicated.
- C. CMUs: ASTM C 90.
 1. Density Classification: Lightweight unless otherwise indicated.
 2. Size (Width): Manufactured to dimensions 3/8 inch less than nominal dimensions.
 3. Exposed Faces: Provide fine texture units suitable for painting.
- D. Concrete Building Brick: ASTM C 55.
 1. Density Classification: Lightweight.
 2. Size (Actual Dimensions): 3-5/8 inches wide by 2-1/4 inches high by 7-5/8 inches long.

2.3 MASONRY LINTELS

- A. Masonry Lintels: Prefabricated or built-in-place masonry lintels made from bond beam CMUs with reinforcing bars placed as indicated and filled with coarse grout. Cure lintels before handling and installing. Temporarily support built-in-place lintels until cured.

2.4 BRICK

- A. Regional Materials: Brick shall be manufactured within 500 miles of Project site from materials that have been extracted, harvested, or recovered, as well as manufactured, within 500 miles of Project site.
- B. General: Provide shapes indicated and as follows, with exposed surfaces matching finish and color of exposed faces of adjacent units:
 - 1. For ends of sills and caps and for similar applications that would otherwise expose unfinished brick surfaces, provide units without cores or frogs and with exposed surfaces finished.
 - 2. Provide special shapes for applications where stretcher units cannot accommodate special conditions, including those at corners, movement joints, bond beams, sashes, and lintels.
 - 3. Provide special shapes for applications requiring brick of size, form, color, and texture on exposed surfaces that cannot be produced by sawing.
 - 4. Provide special shapes for applications where shapes produced by sawing would result in sawed surfaces being exposed to view.
- C. Face Brick: Facing brick complying with ASTM C 216.
 - 1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:
 - a. Interstate Brick; 4-inch Emperor.
 - 2. Grade: SW.
 - 3. Type: FBX.
 - 4. Initial Rate of Absorption: Less than 30 g/30 sq. in. per minute when tested per ASTM C 67.
 - 5. Efflorescence: Provide brick that has been tested according to ASTM C 67 and is rated "not effloresced."
 - 6. Size (Actual Dimensions): 3-5/8 inches wide by 3-5/8 inches high by 15-5/8 inches long.
 - 7. Application: Use where brick is exposed unless otherwise indicated.
 - 8. Color and Texture: As selected by Architect.

2.5 MORTAR AND GROUT MATERIALS

- A. Regional Materials: Aggregate for mortar and grout, cement, and lime shall be extracted, harvested, or recovered, as well as manufactured, within 500 miles of Project site.

- B. Portland Cement: ASTM C 150, Type I or II, except Type III may be used for cold-weather construction. Provide natural color or white cement as required to produce mortar color indicated.
- C. Hydrated Lime: ASTM C 207, Type S.
- D. Portland Cement-Lime Mix: Packaged blend of portland cement and hydrated lime containing no other ingredients.
- E. Mortar Cement: ASTM C 1329.
- F. Mortar Pigments: Natural and synthetic iron oxides and chromium oxides, compounded for use in mortar mixes and complying with ASTM C 979. Use only pigments with a record of satisfactory performance in masonry mortar.
- G. Aggregate for Mortar: ASTM C 144.
- H. Aggregate for Grout: ASTM C 404.
- I. Water: Potable.

2.6 REINFORCEMENT

- A. Uncoated Steel Reinforcing Bars: ASTM A 615/A 615M or ASTM A 996/A 996M, Grade 60.
- B. Masonry Joint Reinforcement, General: ASTM A 951/A 951M.
 - 1. Interior Walls: Mill-galvanized, carbon steel.
 - 2. Exterior Walls: Hot-dip galvanized, carbon steel.
 - 3. Wire Size for Side Rods: 0.148-inch diameter (9 gage).
 - 4. Wire Size for Cross Rods: 0.148-inch diameter (9 gage).
 - 5. Wire Size for Veneer Ties: 0.187-inch diameter.
 - 6. Spacing of Cross Rods, Tabs, and Cross Ties: Not more than 16 inches o.c.
 - 7. Provide in lengths of not less than 10 feet, with prefabricated corner and tee units.
- C. Masonry Joint Reinforcement for Single-Wythe Masonry: Truss type with single pair of side rods.
 - 1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:
 - a. Dayton Superior Corporation, Dur-O-Wal Division; DA3100 Single Wythe Truss.
 - b. Hohmann & Barnard, Inc.; #120 Truss-Mesh.
 - c. Wire-Bond; Series 300 Truss 2 Wire Mesh Reinforcement.

2.7 TIES AND ANCHORS

- A. Materials: Provide ties and anchors specified in this article that are made from materials that comply with the following unless otherwise indicated.

1. Mill-Galvanized, Carbon-Steel Wire: ASTM A 82/A 82M; with ASTM A 641/A 641M, Class 1 coating, for interior walls.
 2. Hot-Dip Galvanized, Carbon-Steel Wire: ASTM A 82/A 82M; with ASTM A 153/A 153M, Class B-2 coating, for exterior walls.
 3. Galvanized Steel Sheet: ASTM A 653/A 653M, Commercial Steel, G60 zinc coating, for interior walls.
 4. Steel Sheet, Galvanized after Fabrication: ASTM A 1008/A 1008M, Commercial Steel, with ASTM A 153/A 153M, Class B coating, for exterior walls.
 5. Steel Plates, Shapes, and Bars: ASTM A 36/A 36M.
 6. Stainless-Steel Bars: ASTM A 276 or ASTM a 666, Type 304.
- B. Wire Ties, General: Unless otherwise indicated, size wire ties to extend at least halfway through veneer but with at least 5/8-inch cover on outside face. Outer ends of wires are bent 90 degrees and extend 2 inches parallel to face of veneer.
- C. Adjustable Anchors for Connecting Masonry Veneer or Isolated Pilasters to Structural Steel Columns: Provide anchors that allow vertical or horizontal adjustment but resist tension and compression forces perpendicular to plane of wall.
1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:
 - a. Dayton Superior Corporation, Dur-O-Wal Division; DA709 Column Anchor Weld-On with DA Series 700 Triangular Tie.
 - b. Hohmann & Barnard, Inc.; #359 Weld-On Tie with #VB Vee Byna-Tie.
 - c. Wire-Bond; Type I Anchor with 1100 Triangular Tie.
 2. Anchor Section for Welding to Steel Frame: Crimped 1/4-inch-diameter, steel wire.
 3. Tie Section: Triangular-shaped wire tie, sized to extend within 1 inch of masonry face, made from 0.187-inch-diameter, steel wire.
- D. Joint Stabilization Anchors: For connecting masonry to steel columns or existing masonry as shown on Drawings. When bent and fastened to the column on one end and embedded in a grouted block core on the other, allows movement between the column and wall parallel to the wall while holding the wall laterally.
1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:
 - a. Dayton Superior Corporation, Dur-O-Wal Division; DA2200 Joint Stabilizing Anchor.
 - b. Hohmann & Barnard, Inc.; Slip-Set Stabilizer.
 - c. Wire-Bond; #1700 Control Joint Anchor.
- E. Wire Mesh Ties: Provide mesh ties at wall intersections built abutting, without control joints.
1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:
 - a. Dayton Superior Corporation, Dur-O-Wal Division; DA960 Wire Mesh Tie.
 - b. Hohmann & Barnard, Inc.; MWT Mesh Wall Tie.

- c. Wire-Bond; #1900 Mesh Tie.
2. Description: 1/2-inch square mesh, made from 0.063-inch (16 gage) steel wire. Provide mesh cut to the following widths:
 - a. At 4-inch masonry units: 3-inch wide mesh.
 - b. At 6-inch masonry units: 4-inch wide mesh.
 - c. At 8-inch masonry units: 6-inch wide mesh.
- F. Adjustable Masonry-Veneer Anchors:
1. General: Provide anchors that allow vertical adjustment but resist tension and compression forces perpendicular to plane of wall, for attachment over insulation and sheathing to metal studs or cold formed metal framing, and as follows:
 - a. Structural Performance Characteristics: Capable of withstanding a 100-lbf load in both tension and compression without deforming or developing play in excess of 0.05 inch.
 2. Screw-Attached, Masonry-Veneer Anchors: Units consisting of a wire tie and a metal anchor section.
 - a. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:
 - 1) Heckmann Building Products Inc.; Pos-I-Tie and Pos-I-Tie Triangle Wire Tie.
 - 2) Hohmann & Barnard, Inc.; 2-Seal Tie Veneer Anchor and 2-Seal Byna-Lok Wire Tie.
 - 3) Wire-Bond; SureTie and SureTie Triangle.
 - b. Anchor Section: Corrosion-resistant, self-drilling, eye-screw designed to receive wire tie. Eye-screw has spacer that seats directly against framing and is same thickness as sheathing and has gasketed, washer head that covers hole in sheathing.
 - c. Wire Ties: Triangular-, rectangular-, or T-shaped wire ties fabricated from 0.187-inch-diameter, steel wire.
- G. Anchors and Dowels for Cast Stone: Fabricate anchors from stainless steel, ASTM A 240/A 240M, Type 304. Fabricate dowels from stainless steel, ASTM A 276, Type 304.
- H. Top-of-Wall Wind Clips: Provide bent, galvanized steel plate clips as detailed on Drawings.

2.8 MISCELLANEOUS ANCHORS

- A. Anchor Bolts: Headed or L-shaped steel bolts complying with ASTM A 307, Grade A; with ASTM A 563 hex nuts and, where indicated, flat washers; hot-dip galvanized to comply with ASTM A 153/A 153M, Class C; of dimensions indicated.

2.9 FLASHING MATERIALS

- A. Metal Flashing: Provide metal flashing complying with SMACNA's "Architectural Sheet Metal Manual" and as follows:
1. Copper: ASTM B 370, Temper H00, cold-rolled copper sheet, 16-oz./sq. ft. weight or 0.0216 inch thick or ASTM B 370, Temper H01, high-yield copper sheet, 12-oz./sq. ft. weight or 0.0162 inch thick.
 2. Fabricate continuous flashings in sections 96 inches long minimum, but not exceeding 12 feet. Provide splice plates at joints of formed, smooth metal flashing.
 3. Fabricate through-wall metal flashing embedded in masonry from copper, with ribs at 3-inch intervals along length of flashing to provide an integral mortar bond.
 - a. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:
 - 1) Cheney Flashing Company; Cheney 3-Way Flashing (Sawtooth).
 - 2) Keystone Flashing Company, Inc.; Keystone 3-Way Interlocking Thruwall Flashing.
 4. Fabricate through-wall flashing with snaplock receiver on exterior face where indicated to receive counterflashing.
 5. Fabricate through-wall flashing with drip edge unless otherwise indicated. Fabricate by extending flashing 1/2 inch out from wall, with outer edge bent down 30 degrees and hemmed.
 6. Fabricate through-wall flashing with sealant stop where indicated. Fabricate by bending metal back on itself 3/4 inch at exterior face of wall and down into joint 1/4 inch to form a stop for retaining sealant backer rod.
 7. Fabricate metal drip edges and sealant stops for ribbed metal flashing from plain metal flashing of same metal as ribbed flashing and extending at least 3 inches into wall with hemmed inner edge to receive ribbed flashing and form a hooked seam. Form hem on upper surface of metal so that completed seam will shed water.
- B. Termination Bars: Stainless steel bar 1/8-inch by minimum 1-inch, for attachment at 8-inch centers.
1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:
 - a. Dayton Superior Corporation, Dur-O-Wal Division; DA1510 Termination Bar.
 - b. Hohmann & Barnard, Inc.; #T1 Termination Bar.
- C. Adhesives, Primers, and Seam Tapes for Flashings: Flashing manufacturer's standard products or products recommended by flashing manufacturer for bonding flashing sheets to each other and to substrates.

2.10 MISCELLANEOUS MASONRY ACCESSORIES

- A. Compressible Filler: Premolded filler strips complying with ASTM D 1056, Grade 2A1; compressible up to 35 percent; of width and thickness indicated; formulated from neoprene.

1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:
 - a. Dayton Superior Corporation, Dur-O-Wal Division; DA2010/2015 Rapid Soft Joint/Expansion Joint.
 - b. Hohmann & Barnard, Inc.; NS Closed Cell Neoprene Sponge.
 - c. Wire-Bond; Expansion Joint 3300.

- B. Preformed Control-Joint Gaskets: Made from styrene-butadiene-rubber compound, complying with ASTM D 2000, Designation M2AA-805 and designed to fit standard sash block and to maintain lateral stability in masonry wall; size and configuration as indicated.
 1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:
 - a. Dayton Superior Corporation, Dur-O-Wal Division; Rubber Control Joint.
 - b. Hohmann & Barnard, Inc.; #RS Series Rubber Control Joint.
 - c. Wire-Bond; Control Joint.

- C. Bond-Breaker Strips: Asphalt-saturated, organic roofing felt complying with ASTM D 226, Type I (No. 15 asphalt felt).

- D. Weep/Vent Products: Use the following unless otherwise indicated:
 1. Cellular Plastic Weep/Vent: One-piece, flexible extrusion made from UV-resistant polypropylene copolymer, full height and width of head joint and depth 1/8 inch less than depth of outer wythe, in color selected from manufacturer's standard.
 - a. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:
 - 1) Advanced Building Products Inc.; Mortar Maze weep vent.
 - 2) Dayton Superior Corporation, Dur-O-Wal Division; Cell Vents.
 - 3) Heckmann Building Products Inc.; No. 85 Cell Vent.
 - 4) Hohmann & Barnard, Inc.; Quadro-Vent.
 - 5) Wire-Bond; Cell Vent.

- E. Cavity Drainage Material: Free-draining mesh, made from polymer strands that will not degrade within the wall cavity.
 1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:
 - a. Advanced Building Products Inc.; Mortar Break.
 - b. Mortar Net USA, Ltd.; Mortar Net.
 2. Provide one of the following configurations:
 - a. Strips, full-depth of cavity and 10 inches high, with dovetail shaped notches 7 inches deep that prevent clogging with mortar droppings.

- b. Strips, not less than 3/4 inch thick and 10 inches high, with dimpled surface designed to catch mortar droppings and prevent weep holes from clogging with mortar.
- F. Reinforcing Bar Positioners: Wire units designed to fit into mortar bed joints spanning masonry unit cells and hold reinforcing bars in center of cells. Units are formed from 0.148-inch steel wire, hot-dip galvanized after fabrication. Provide units designed for number of bars indicated.
1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:
 - a. Dayton Superior Corporation, Dur-O-Wal Division; D/A 810, D/A 812 or D/A 817.
 - b. Heckmann Building Products Inc.; No. 376 Rebar Positioner.
 - c. Hohmann & Barnard, Inc.; #RB or #RB-Twin Rebar Positioner.
 - d. Wire-Bond; O-Ring or Double O-Ring Rebar Positioner.
- G. Grout Screen: Monofilament, non-corrosive screen designed to isolate flow of grout in designated areas while maintaining positive bond in mortar.

2.11 MASONRY CLEANERS

- A. Proprietary Acidic Cleaner: Manufacturer's standard-strength cleaner designed for removing mortar/grout stains, efflorescence, and other new construction stains from new masonry without discoloring or damaging masonry surfaces. Use product expressly approved for intended use by cleaner manufacturer and manufacturer of masonry units being cleaned.
1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - a. Diedrich Technologies, Inc.
 - b. EaCo Chem, Inc.
 - c. ProSoCo, Inc.

2.12 MORTAR AND GROUT MIXES

- A. General: Do not use admixtures, including pigments, air-entraining agents, accelerators, retarders, water-repellent agents, antifreeze compounds, or other admixtures, unless otherwise indicated.
1. Do not use calcium chloride in mortar or grout.
 2. Use portland cement-lime or mortar cement mortar unless otherwise indicated.
- B. Preblended, Dry Mortar Mix: Furnish dry mortar ingredients in form of a preblended mix. Measure quantities by weight to ensure accurate proportions, and thoroughly blend ingredients before delivering to Project site.

- C. Mortar for Unit Masonry: Comply with ASTM C 270, Proportion or Property Specification. Provide the following types of mortar for applications stated unless another type is indicated.
1. For masonry bearing walls, shear walls and masonry below grade or in contact with earth, use Type S.
 2. For masonry veneer and other applications other than those noted for Type S mortar, use Type N.
- D. Grout for Unit Masonry: Comply with ASTM C 476.
1. Use fine grout.
 2. Proportion grout in accordance with ASTM C 476, Table 1 or paragraph 4.2.2 for specified 28-day compressive strength indicated, but not less than 2000 psi.
 3. Provide grout with a slump of 8 to 11 inches as measured according to ASTM C 143/C 143M.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.
1. Verify that foundations are within tolerances specified.
 2. Verify that reinforcing dowels are properly placed.
- B. Before installation, examine rough-in and built-in construction for piping systems to verify actual locations of piping connections.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.
- D. Beginning installation constitutes Contractor's acceptance of substrates and conditions.

3.2 INSTALLATION, GENERAL

- A. Thickness: Build cavity and composite walls and other masonry construction to full thickness shown. Build single-wythe walls to actual widths of masonry units, using units of widths indicated.
- B. Build chases and recesses to accommodate items specified in this and other Sections.
- C. Leave openings for equipment to be installed before completing masonry. After installing equipment, complete masonry to match the construction immediately adjacent to opening.
- D. Use full-size units without cutting if possible. If cutting is required to provide a continuous pattern or to fit adjoining construction, cut units with motor-driven saws; provide clean, sharp, unchipped edges. Allow units to dry before laying unless wetting of units is specified. Install cut units with cut surfaces and, where possible, cut edges concealed.

- E. Select and arrange units for exposed unit masonry to produce a uniform blend of colors and textures.
- F. Wetting of Brick: Wet brick before laying if initial rate of absorption exceeds 30 g/30 sq. in. per minute when tested per ASTM C 67. Allow units to absorb water so they are damp but not wet at time of laying.

3.3 TOLERANCES

A. Dimensions and Locations of Elements:

- 1. For dimensions in cross section or elevation do not vary by more than plus 1/2 inch or minus 1/4 inch.
- 2. For location of elements in plan do not vary from that indicated by more than plus or minus 1/2 inch.
- 3. For location of elements in elevation do not vary from that indicated by more than plus or minus 1/4 inch in a story height or 1/2 inch total.

B. Lines and Levels:

- 1. For bed joints and top surfaces of bearing walls do not vary from level by more than 1/4 inch in 10 feet, or 1/2 inch maximum.
- 2. For conspicuous horizontal lines, such as lintels, sills, parapets, and reveals, do not vary from level by more than 1/8 inch in 10 feet, 1/4 inch in 20 feet, or 1/2 inch maximum.
- 3. For vertical lines and surfaces do not vary from plumb by more than 1/4 inch in 10 feet, 3/8 inch in 20 feet, or 1/2 inch maximum.
- 4. For conspicuous vertical lines, such as external corners, door jambs, reveals, and expansion and control joints, do not vary from plumb by more than 1/8 inch in 10 feet, 1/4 inch in 20 feet, or 1/2 inch maximum.
- 5. For lines and surfaces do not vary from straight by more than 1/4 inch in 10 feet, 3/8 inch in 20 feet, or 1/2 inch maximum.
- 6. For vertical alignment of exposed head joints, do not vary from plumb by more than 1/4 inch in 10 feet, or 1/2 inch maximum.
- 7. For faces of adjacent exposed masonry units, do not vary from flush alignment by more than 1/16 inch except due to warpage of masonry units within tolerances specified for warpage of units.

C. Joints:

- 1. For bed joints, do not vary from thickness indicated by more than plus or minus 1/8 inch, with a maximum thickness limited to 1/2 inch.
- 2. For exposed bed joints, do not vary from bed-joint thickness of adjacent courses by more than 1/8 inch.
- 3. For head and collar joints, do not vary from thickness indicated by more than plus 3/8 inch or minus 1/4 inch.
- 4. For exposed head joints, do not vary from thickness indicated by more than plus or minus 1/8 inch. Do not vary from adjacent bed-joint and head-joint thicknesses by more than 1/8 inch.
- 5. For exposed bed joints and head joints of stacked bond, do not vary from a straight line by more than 1/16 inch from one masonry unit to the next.

3.4 LAYING MASONRY WALLS

- A. Lay out walls in advance for accurate spacing of surface bond patterns with uniform joint thicknesses and for accurate location of openings, movement-type joints, returns, and offsets. Avoid using less-than-half-size units, particularly at corners, jambs, and, where possible, at other locations.
- B. Bond Pattern for Exposed Masonry: Unless otherwise indicated, lay exposed masonry in running bond; do not use units with less than nominal 4-inch horizontal face dimensions at corners or jambs.
- C. Lay concealed masonry with all units in a wythe in running bond or bonded by lapping not less than 2 inches. Bond and interlock each course of each wythe at corners. Do not use units with less than nominal 4-inch horizontal face dimensions at corners or jambs.
- D. Stopping and Resuming Work: Stop work by racking back units in each course from those in course below; do not tooth. When resuming work, clean masonry surfaces that are to receive mortar, remove loose masonry units and mortar, and wet brick if required before laying fresh masonry.
- E. Built-in Work: As construction progresses, build in items specified in this and other Sections. Fill in solidly with masonry around built-in items.
- F. Fill space between steel frames and masonry solidly with mortar unless otherwise indicated.
- G. Where built-in items are to be embedded in cores of hollow masonry units, place a layer of metal lath, wire mesh, or plastic mesh in the joint below and rod mortar or grout into core.
- H. Fill cores in hollow CMUs with grout 24 inches under bearing plates, beams, lintels, posts, and similar items unless otherwise indicated.
- I. Build non-load-bearing interior partitions full height of story to underside of solid floor or roof structure above unless otherwise indicated.
 - 1. Install compressible filler in joint between top of partition and underside of structure above.
 - 2. At fire-rated partitions, treat joint between top of partition and underside of structure above to comply with Division 07 Section "Fire-Resistive Joint Systems."
- J. Install top-of-wall wind clips as shown on Drawings.

3.5 MORTAR BEDDING AND JOINTING

- A. Lay hollow CMUs as follows:
 - 1. With face shells fully bedded in mortar and with head joints of depth equal to bed joints.
 - 2. With webs fully bedded in mortar in all courses of piers, columns, and pilasters.
 - 3. With webs fully bedded in mortar in grouted masonry, including starting course on footings.

4. With entire units, including areas under cells, fully bedded in mortar at starting course on footings where cells are not grouted.
- B. Lay solid masonry units with completely filled bed and head joints; butter ends with sufficient mortar to fill head joints and shove into place. Do not deeply furrow bed joints or slush head joints.
- C. Set cast stone trim units in full bed of mortar with full vertical joints. Fill dowel, anchor, and similar holes.
 1. Clean soiled surfaces with fiber brush and soap powder and rinse thoroughly with clear water.
 2. Wet joint surfaces thoroughly before applying mortar.
- D. Tool exposed joints slightly concave when thumbprint hard, using a jointer larger than joint thickness unless otherwise indicated.
 1. For glazed masonry units, use a nonmetallic jointer 3/4 inch or more in width.

3.6 COMPOSITE MASONRY

- A. Bond wythes of composite masonry together using the following method:
 1. Masonry Joint Reinforcement: Installed in horizontal mortar joints.
 - a. Use adjustable (two-piece) type reinforcement.
- B. Collar Joints: Solidly fill collar joints by parging face of first wythe that is laid and shoving units of other wythe into place.
- C. Corners: Provide interlocking masonry unit bond in each wythe and course at corners unless otherwise indicated.
 1. Provide continuity with masonry joint reinforcement at corners by using prefabricated L-shaped units as well as masonry bonding.
- D. Intersecting and Abutting Walls: Unless vertical expansion or control joints are shown at juncture, bond walls together as follows:
 1. Provide continuity with masonry joint reinforcement by using prefabricated T-shaped units.

3.7 CAVITY WALLS

- A. Bond wythes of cavity walls together using one of the following methods:
 1. Masonry Joint Reinforcement: Installed in horizontal mortar joints.
 - a. Use adjustable (two-piece) type reinforcement.

2. Masonry Veneer Anchors: Comply with requirements for anchoring masonry veneers.
- B. Keep cavities clean of mortar droppings and other materials during construction. Bevel beds away from cavity, to minimize mortar protrusions into cavity. Do not attempt to trowel or remove mortar fins protruding into cavity.

3.8 MASONRY JOINT REINFORCEMENT

- A. General: Install entire length of longitudinal side rods in mortar with a minimum cover of 5/8 inch on exterior side of walls, 1/2 inch elsewhere. Lap reinforcement a minimum of 6 inches.
1. Space reinforcement not more than 16 inches o.c.
 2. Space reinforcement not more than 8 inches o.c. in parapet walls.
 3. Provide reinforcement not more than 8 inches above and below wall openings and extending 12 inches beyond openings in addition to continuous reinforcement.
- B. Interrupt joint reinforcement at control and expansion joints unless otherwise indicated.
- C. Provide continuity at wall intersections by using prefabricated T-shaped units.
- D. Provide continuity at corners by using prefabricated L-shaped units.
- E. Cut and bend reinforcing units as directed by manufacturer for continuity at returns, offsets, column fireproofing, pipe enclosures, and other special conditions.
- F. Veneer: Space single wire joint reinforcement at 16 inches o.c. vertically. Connect joint reinforcement to each veneer tie with a connector section. Connector section to be attached to veneer ties per manufacturer's recommendations.

3.9 ANCHORING MASONRY TO STRUCTURAL STEEL AND CONCRETE

- A. Anchor masonry to structural steel and concrete where masonry abuts or faces structural steel or concrete to comply with the following:
1. Provide an open space not less than 1 inch wide between masonry and structural steel or concrete unless otherwise indicated. Keep open space free of mortar and other rigid materials.
 2. Anchor masonry with anchors embedded in masonry joints and attached to structure.
 3. Space anchors as indicated, but not more than 16 inches o.c. vertically and 16 inches o.c. horizontally.

3.10 ANCHORING MASONRY VENEERS

- A. Anchor masonry veneers to wall framing, and masonry backup with masonry-veneer anchors to comply with the following requirements:
1. Fasten screw-attached anchors through sheathing to wall framing with metal fasteners of type indicated. Use two fasteners unless anchor design only uses one fastener.

2. Embed tie sections, connector sections and continuous wire in masonry joints. Provide not less than 2 inches of air space between back of masonry veneer and face of sheathing.
3. Locate anchor sections to allow maximum vertical differential movement of ties up and down.
4. Space anchors as indicated, but not more than 16 inches o.c. vertically and 16 inches o.c. horizontally, with not less than 1 anchor for each 2 sq. ft. of wall area. Install additional anchors within 12 inches of openings and at intervals, not exceeding 8 inches, around perimeter.

3.11 CONTROL AND EXPANSION JOINTS

- A. General: Install control and expansion joint materials in unit masonry as masonry progresses. Do not allow materials to span control and expansion joints without provision to allow for in-plane wall or partition movement.
- B. Form control joints in concrete masonry as follows:
 1. Fit bond-breaker strips into hollow contour in ends of CMUs on one side of control joint. Fill resultant core with grout and rake out joints in exposed faces for application of sealant.
 2. Install preformed control-joint gaskets designed to fit standard sash block.
- C. Form control joints at all column locations per typical details on Drawings.
- D. Form expansion joints in brick as follows:
 1. Build in compressible joint fillers where indicated.
 2. Form open joint full depth of brick wythe and of width indicated, but not less than 3/8 inch for installation of sealant and backer rod specified in Division 07 Section "Joint Sealants."
- E. Provide horizontal, pressure-relieving joints by either leaving an air space or inserting a compressible filler of width required for installing sealant and backer rod specified in Division 07 Section "Joint Sealants," but not less than 3/8 inch.
 1. Locate horizontal, pressure-relieving joints beneath shelf angles supporting masonry.

3.12 LINTELS

- A. Install steel lintels where indicated.
- B. Provide masonry lintels where shown and where openings of more than 12 inches for brick-size units and 24 inches for block-size units are shown without structural steel or other supporting lintels.
 1. Cure lintels before handling and installing.
 2. Use specially formed "U"-shape lintel units with reinforcement bars placed as shown and filled with grout.

3. Shore all lintels after lintel has been adjusted and before masonry is placed over lintel. Maintain shoring in place for at least 3 days after masonry has been completed over lintel.

- C. Provide minimum bearing of 8 inches at each jamb unless otherwise indicated.

3.13 FLASHING, WEEP HOLES, CAVITY DRAINAGE, AND VENTS

- A. General: Install flashing and weep holes in masonry at shelf angles, lintels, ledges, other obstructions to downward flow of water in wall, and where indicated. Install vents at shelf angles, ledges, and other obstructions to upward flow of air in cavities, and where indicated.

- B. Install flashing as follows unless otherwise indicated:

1. Prepare masonry surfaces so they are smooth and free from projections that could puncture flashing. Where flashing is within mortar joint, place through-wall flashing on sloping bed of mortar and cover with mortar. Before covering with mortar, seal penetrations in flashing with adhesive, sealant, or tape as recommended by flashing manufacturer.
2. At multiwythe masonry walls, including cavity walls, extend flashing through outer wythe, turned up a minimum of 8 inches, and at least 2 inches above top of cavity drainage material
3. At masonry-veneer walls, extend flashing through veneer, across air space behind veneer, and up face of sheathing at least 8 inches; and at least 2 inches above top of cavity drainage material.
4. Secure top of flashing with metal termination bar attached to wall framing 8 inches on center with stainless steel fasteners appropriate for substrate. Apply a continuous bead of compatible sealant to top of the bar.
5. At lintels and shelf angles, extend flashing a minimum of 6 inches into masonry at each end. At heads and sills, extend flashing 6 inches at ends and turn up not less than 2 inches to form end dams.
6. Interlock end joints of ribbed sheet metal flashing by overlapping ribs not less than 1-1/2 inches or as recommended by flashing manufacturer, and seal lap with elastomeric sealant complying with requirements in Division 07 Section "Joint Sealants" for application indicated.
7. Install metal drip edges and sealant stops with ribbed sheet metal flashing by interlocking hemmed edges to form hooked seam. Seal seam with elastomeric sealant complying with requirements in Division 07 Section "Joint Sealants" for application indicated.

- C. Install weep holes in head joints in exterior wythes of first course of masonry immediately above flashing and as follows:

1. Use specified weep/vent products to form weep holes.
2. Space weep holes 32 inches o.c. unless otherwise indicated.

- D. Place cavity drainage material in cavities to comply with configuration requirements for cavity drainage material in "Miscellaneous Masonry Accessories" Article.

- E. Install vents in head joints in exterior wythes at 48 inches o.c., unless otherwise indicated. Use specified weep/vent products to form vents.

3.14 REINFORCED UNIT MASONRY INSTALLATION

- A. Temporary Formwork and Shores: Construct formwork and shores as needed to support reinforced masonry elements during construction.
 - 1. Construct formwork to provide shape, line, and dimensions of completed masonry as indicated. Make forms sufficiently tight to prevent leakage of mortar and grout. Brace, tie, and support forms to maintain position and shape during construction and curing of reinforced masonry.
 - 2. Do not remove forms and shores until reinforced masonry members have hardened sufficiently to carry their own weight and other loads that may be placed on them during construction.
- B. Placing Reinforcement: Comply with requirements in ACI 530.1/ASCE 6/TMS 602.
- C. Grouting: Do not place grout until entire height of masonry to be grouted has attained enough strength to resist grout pressure.
 - 1. Comply with requirements in ACI 530.1/ASCE 6/TMS 602 for cleanouts and for grout placement, including minimum grout space and maximum pour height.
 - 2. Limit height of vertical grout pours to not more than 60 inches.

3.15 FIELD QUALITY CONTROL

- A. Testing and Inspecting: Owner will engage special inspectors to perform tests and inspections and prepare reports. Allow inspectors access to scaffolding and work areas, as needed to perform tests and inspections. Retesting of materials that fail to comply with specified requirements shall be done at Contractor's expense.
- B. Inspections: Level 1 special inspections as defined by the "2006 International Building Code", including:
 - 1. All items described in the Statement of Special Inspections in Division 01 Section "Quality Requirements".
 - 2. Begin masonry construction only after inspectors have verified proportions of site-prepared mortar.
 - 3. Place grout only after inspectors have verified compliance of grout spaces and of grades, sizes, and locations of reinforcement.
 - 4. Place grout only after inspectors have verified proportions of site-prepared grout.
 - 5. Inspect masonry construction and compare with pre-approved mockup that establishes standard of quality and workmanship.
 - 6. Inspect anchors, ties and accessories for size, type, spacing, material type and proper installation.
 - 7. Inspect masonry shear wall construction for compliance with the Drawings.
 - a. Check wall support for dowels required to transfer loads from wall to support.
 - b. Check wall for required grouting and reinforcing in block cores, bond beams, horizontal reinforcing, etc.
 - c. Check the construction of the top of the wall.

8. Inspect each exterior masonry wall for required lateral support, at the top of the wall from beams and/or at the side from columns.
 - a. Check those walls, where shown on the Drawings as requiring top-of-wall wind clips, for compliance with the Drawings.
 - b. Check those walls, where shown on the Drawings as requiring support from columns that the wall-column tie in detail is in compliance with the Contract Documents.
 9. Check interior walls, where shown on the Drawings as requiring top-of-wall wind clips, for compliance with the Drawings.
- C. Clay Masonry Unit Test: For each type of unit provided, according to ASTM C 67 for compressive strength.
- D. Concrete Masonry Unit Test: For each type of unit provided, according to ASTM C 140 for compressive strength.
- E. Mortar Test (Property Specification): For each mix provided, according to ASTM C 780. Test mortar for mortar air content and compressive strength.
- F. Grout Test (Compressive Strength): For each mix provided, according to ASTM C 1019.

3.16 PARGING

- A. Parge exterior faces of below-grade masonry walls, where indicated, in 2 uniform coats to a total thickness of 3/4 inch. Dampen wall before applying first coat and scarify first coat to ensure full bond to subsequent coat.
- B. Use a steel-trowel finish to produce a smooth, flat, dense surface with a maximum surface variation of 1/8 inch per foot. Form a wash at top of parging and a cove at bottom.
- C. Damp-cure parging for at least 24 hours and protect parging until cured.

3.17 REPAIRING, POINTING, AND CLEANING

- A. Remove and replace masonry units that are loose, chipped, broken, stained, or otherwise damaged or that do not match adjoining units. Install new units to match adjoining units; install in fresh mortar, pointed to eliminate evidence of replacement.
- B. Pointing: During the tooling of joints, enlarge voids and holes, except weep holes, and completely fill with mortar. Point up joints, including corners, openings, and adjacent construction, to provide a neat, uniform appearance. Prepare joints for sealant application, where indicated.
- C. In-Progress Cleaning: Clean unit masonry as work progresses by dry brushing to remove mortar fins and smears before tooling joints.
- D. Final Cleaning: After mortar is thoroughly set and cured, clean exposed masonry as follows:

1. Remove large mortar particles by hand with wooden paddles and nonmetallic scrape hoes or chisels.
2. Test cleaning methods on sample wall panel; leave one-half of panel uncleaned for comparison purposes. Obtain Architect's approval of sample cleaning before proceeding with cleaning of masonry.
3. Protect adjacent stone and nonmasonry surfaces from contact with cleaner by covering them with liquid strippable masking agent or polyethylene film and waterproof masking tape.
4. Wet wall surfaces with water before applying cleaners; remove cleaners promptly by rinsing surfaces thoroughly with clear water.
5. Clean brick by bucket-and-brush hand-cleaning method described in BIA Technical Notes 20.
6. Clean masonry with a proprietary acidic cleaner applied according to manufacturer's written instructions.
7. Clean concrete masonry by cleaning method indicated in NCMA TEK 8-2A applicable to type of stain on exposed surfaces.

END OF SECTION

SPEC SECTION 08 14 16

FLUSH WOOD DOORS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:
 - 1. Solid-core doors with wood-veneer faces.
 - 2. Factory finishing flush wood doors.
 - 3. Factory fitting flush wood doors to frames and factory machining for hardware.

1.3 SUBMITTALS, GENERAL

- A. General: Submit all action submittals (except Samples for Verification) required by this Section concurrently.

1.4 ACTION SUBMITTALS

- A. Product Data: For each type of door indicated. Include details of core and edge construction and trim for openings. Include factory-finishing specifications.
- B. Shop Drawings: Indicate location, size, and hand of each door; elevation of each kind of door; construction details not covered in Product Data; location and extent of hardware blocking; and other pertinent data.
 - 1. Indicate dimensions and locations of mortises and holes for hardware.
 - 2. Indicate dimensions and locations of cutouts.
 - 3. Indicate requirements for veneer matching.
 - 4. Indicate doors to be factory finished and finish requirements.
 - 5. Indicate fire-protection ratings for fire-rated doors.
- C. Samples for Initial Selection: For factory-finished doors.
- D. Samples for Verification:
 - 1. Factory finishes applied to actual door face materials, approximately 8 by 10 inches, for each material and finish. For each wood species and transparent finish, provide set of

three samples showing typical range of color and grain to be expected in the finished work.

- E. Warranty: Sample of special warranty.

1.5 CLOSEOUT SUBMITTALS

- A. Warranty: Executed special warranty.

1.6 QUALITY ASSURANCE

- A. Manufacturer Qualifications: A qualified manufacturer that is certified for chain of custody by an FSC-accredited certification body.
- B. Source Limitations: Obtain flush wood doors from single manufacturer.
- C. Quality Standard: In addition to requirements specified, comply with WDMA I.S.1-A, "Architectural Wood Flush Doors."
- D. Fire-Rated Wood Doors: Doors complying with NFPA 80 that are listed and labeled by a qualified testing agency, for fire-protection ratings indicated, based on testing at positive pressure according to NFPA 252 or UL 10C.
 - 1. Temperature-Rise Limit: At vertical exit enclosures and exit passageways, provide doors that have a maximum transmitted temperature end point of not more than 450 deg F above ambient after 30 minutes of standard fire-test exposure.
- E. Preinstallation Conference: Conduct conference at Project site.

1.7 DELIVERY, STORAGE, AND HANDLING

- A. Comply with requirements of referenced standard and manufacturer's written instructions.
- B. Package doors individually in plastic bags or cardboard cartons.
- C. Mark each door on bottom rail with opening number used on Shop Drawings.

1.8 PROJECT CONDITIONS

- A. Environmental Limitations: Do not deliver or install doors until spaces are enclosed and weathertight, wet work in spaces is complete and dry, and HVAC system is operating and maintaining ambient temperature and humidity conditions at occupancy levels during the remainder of the construction period.

1.9 WARRANTY

- A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace doors that fail in materials or workmanship within specified warranty period.
1. Failures include, but are not limited to, the following:
 - a. Warping (bow, cup, or twist) more than 1/4 inch in a 42-by-84-inch section.
 - b. Telegraphing of core construction in face veneers exceeding 0.01 inch in a 3-inch span.
 2. Warranty shall also include installation and finishing that may be required due to repair or replacement of defective doors.
 3. Warranty Period for Solid-Core Interior Doors: Life of installation.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
1. VT Industries Architectural Wood Doors, or approved equal.

2.2 DOOR CONSTRUCTION, GENERAL

- A. Certified Wood: Fabricate doors with not less than 70 percent of wood products produced from wood obtained from forests certified by an FSC-accredited certification body to comply with FSC STD-01-001, "FSC Principles and Criteria for Forest Stewardship."
- B. Low-Emitting Materials: Fabricate doors with adhesives that do not contain urea formaldehyde.
- C. WDMA I.S.1-A Performance Grade: Extra Heavy Duty.
- D. Structural-Composite-Lumber-Core Doors:
1. Structural Composite Lumber: WDMA I.S.10.
 - a. Screw Withdrawal, Face: 700 lbf.
 - b. Screw Withdrawal, Edge: 400 lbf.
- E. Fire-Protection-Rated Doors: Provide core specified or mineral core as needed to provide fire-protection rating indicated.
1. Edge Construction: Provide edge construction with intumescent seals concealed by outer stile. Comply with specified requirements for exposed edges.
 2. Pairs: Provide fire-retardant stiles that are listed and labeled for applications indicated without formed-steel edges and astragals. Provide stiles with concealed intumescent seals. Comply with specified requirements for exposed edges.

F. Mineral-Core Doors:

1. Core: Noncombustible mineral product complying with requirements of referenced quality standard and testing and inspecting agency for fire-protection rating indicated.
2. Blocking: Provide composite blocking with improved screw-holding capability approved for use in doors of fire-protection ratings indicated as needed to eliminate through-bolting hardware.
3. Edge Construction: At hinge stiles, provide laminated-edge construction with improved screw-holding capability and split resistance. Comply with specified requirements for exposed edges.

2.3 VENEERED-FACED DOORS FOR TRANSPARENT FINISH

A. Interior Solid-Core Doors:

1. Grade: Premium, with Grade A faces.
2. Species: Birch Veneer.
3. Cut: Plane Sliced.
4. Match between Veneer Leaves: Book match.
5. Assembly of Veneer Leaves on Door Faces: Balance match.
6. Pair and Set Match: Provide for doors hung in same opening or separated only by mullions.
7. Exposed Vertical and Top Edges: Same species as faces.
8. Core: Either glued wood stave or structural composite lumber.
9. Construction: Five plies. Stiles and rails are bonded to core, then entire unit abrasive planed before veneering. Faces are bonded to core using a hot press.

2.4 LIGHT FRAMES

A. Wood Beads for Light Openings in Wood Doors: Provide manufacturer's standard wood beads as follows unless otherwise indicated.

1. Wood Species: Same species as door faces.
2. Profile: Lipped beads, overlapping door face veneer.

B. Metal Frames for Light Openings in Fire-Rated Doors: Manufacturer's standard frame formed of 0.048-inch-thick, cold-rolled steel sheet; with baked-enamel- or powder-coated finish; and approved for use in doors of fire-protection rating indicated.

2.5 FABRICATION

A. Factory fit doors to suit frame-opening sizes indicated. Comply with clearance requirements of referenced quality standard for fitting unless otherwise indicated.

1. Comply with requirements in NFPA 80 for fire-rated doors.

- B. Factory machine doors for hardware that is not surface applied. Locate hardware to comply with DHI-WDHS-3. Comply with final hardware schedules, door frame Shop Drawings, DHI A115-W series standards, and hardware templates.
 - 1. Coordinate with hardware mortises in metal frames to verify dimensions and alignment before factory machining.
- C. Openings: Cut and trim openings through doors in factory.
 - 1. Light Openings: Trim openings with moldings of material and profile indicated.
 - 2. Glazing: Factory install glazing in doors indicated to be factory finished. Comply with applicable requirements in Division 08 Section "Glazing."

2.6 FACTORY FINISHING

- A. General: Comply with referenced quality standard for factory finishing. Complete fabrication, including fitting doors for openings and machining for hardware that is not surface applied, before finishing.
 - 1. Finish faces, all four edges, edges of cutouts, and mortises. Stains and fillers may be omitted on bottom edges, edges of cutouts, and mortises.
- B. Finish doors at factory.
- C. Use only paints and coatings that comply with the testing and product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers."
- D. Transparent Finish:
 - 1. Grade: Premium.
 - 2. Finish: WDMA TR-6 catalyzed polyurethane.
 - 3. Veneer Finish: Riverstone.
 - 4. Effect: Semifilled finish, produced by applying an additional finish coat to partially fill the wood pores.
 - 5. Sheen: Semigloss.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine doors and installed door frames before hanging doors.
 - 1. Verify that frames comply with indicated requirements for type, size, location, and swing characteristics and have been installed with level heads and plumb jambs.
 - 2. Reject doors with defects.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

- C. Beginning installation constitutes Contractor's acceptance of substrates and conditions.

3.2 INSTALLATION

- A. Hardware: For installation, see Division 08 Section "Door Hardware."
- B. Installation Instructions: Install doors to comply with manufacturer's written instructions and the referenced quality standard, and as indicated.
 - 1. Install fire-rated doors in corresponding fire-rated frames according to NFPA 80.
- C. Factory-Fitted Doors: Align in frames for uniform clearance at each edge.
- D. Factory-Finished Doors: Restore finish before installation if fitting or machining is required at Project site.

3.3 ADJUSTING

- A. Operation: Rehang or replace doors that do not swing or operate freely.
- B. Finished Doors: Replace doors that are damaged or that do not comply with requirements. Doors may be repaired or refinished if work complies with requirements and shows no evidence of repair or refinishing.

END OF SECTION